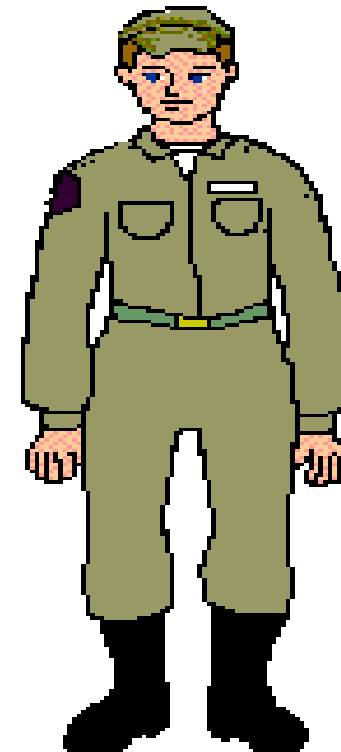




Armed Forces College of Medicine AFCM





The Gluteal Region I

By

Prof Azza Kamal

Intended Learning Outcomes



By the end of this lecture, each student should be able to:

- 1) Define** the gluteal region.
- 2) Enumerate** the cutaneous nerve supply of the four quadrants of this region.
- 3) Describe** the attachments, nerve supply and action of the three glutei & tensor fasciae latae .
- 4) Describe** the important role of glutei medius & minimus during walking .
- 5) Comment** on the effect of unilateral or bilateral paralysis of glutei medius and minimus.
- 6) Demonstrate** the safe site for giving IM injection in the gluteal region.

KEY POINTS OF LECTURE

1) Attachment, nerve supply & action of:

a) Gluteus maximus

b) Gluteus medius

c) Gluteus minimus

d) Tensor fascialatae

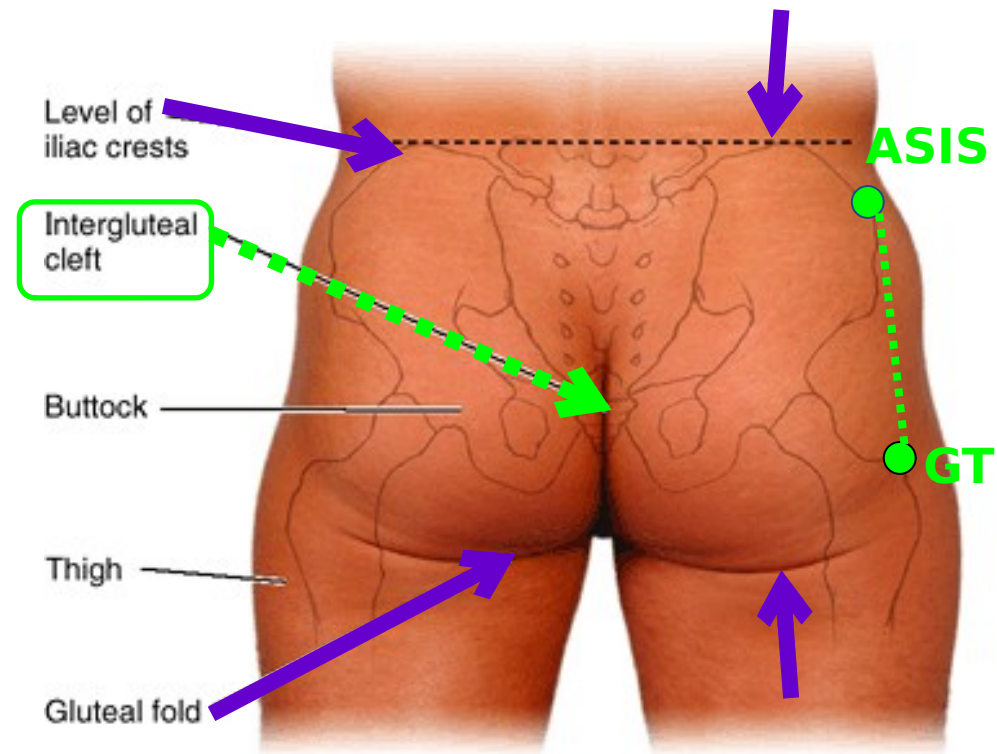
2) Role of Gluteus medius & minimus during walking

3) Effect of unilateral & bilateral paralysis of Gluteus medius & minimus

4) Safe site for giving IM injection

Gluteal Region:

- It extends from the **iliac crest** above to the **gluteal fold** below
- & from the natal cleft (intergluteal cleft) medially to a line extending from **ASIS** to **Greater**



<https://lh3.googleusercontent.com/wRVKQZM0sgUh3FKHO71Ygo>

NB: gluteal fold is a skin fold at the junction between gluteal region & back of thigh.



Cutaneous nerves of the gluteal region

Upper & Anterior:
Subcostal (T12)

Iliohypogastric (L1)

Upper & Posterior:

Post rami of L1,2,3

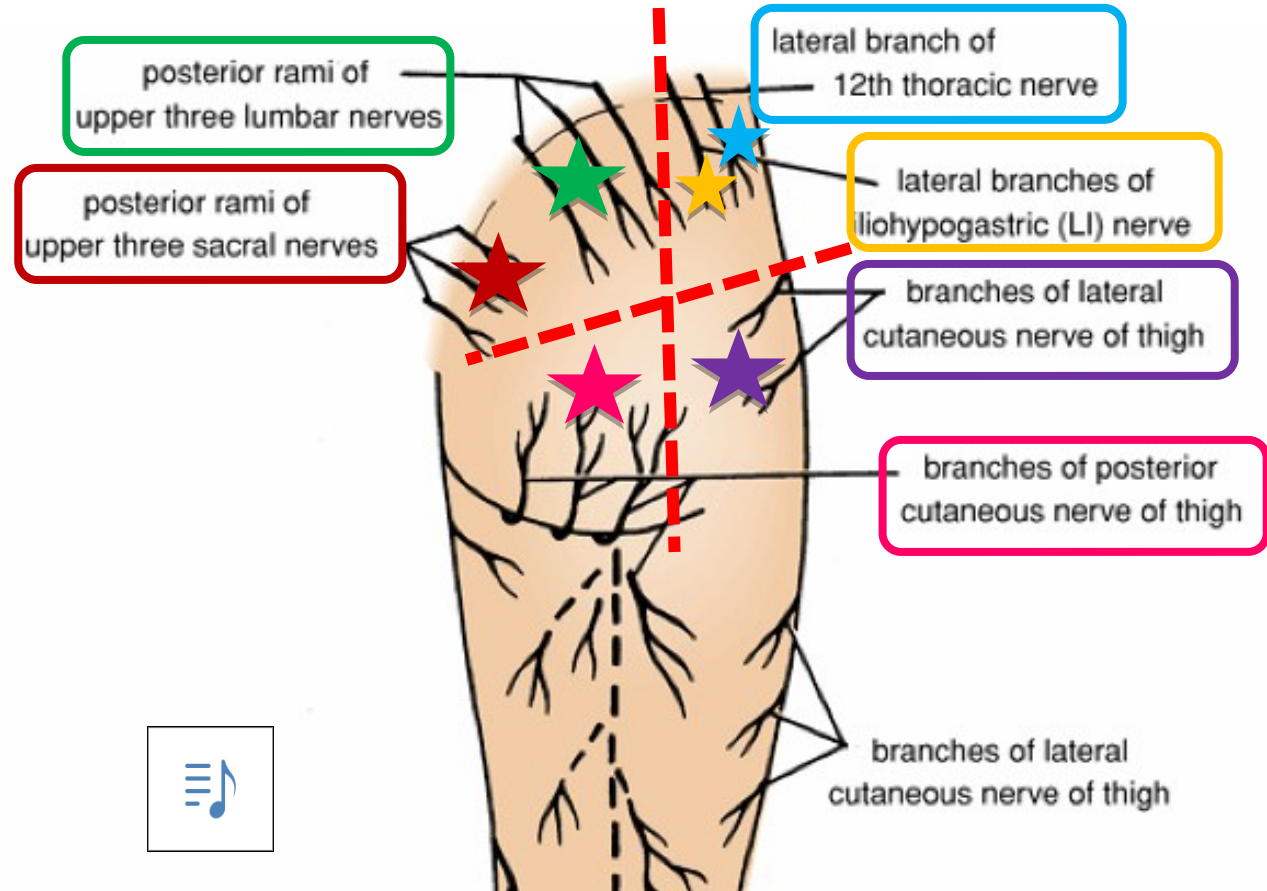
Post rami of S1,2,3

Lower & Anterior:

Lat.cut.n.of thigh L2,3

Lower & Posterior:

Post.cut.n.of thigh S1,2,3



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Muscles of the gluteal region

Large muscles

Glutei 3"

Small muscles

lateral 6"

**All these muscles are supplied by nerves derived from
sacral plexus
except one muscle which is supplied by a nerve from
lumbar plexus**

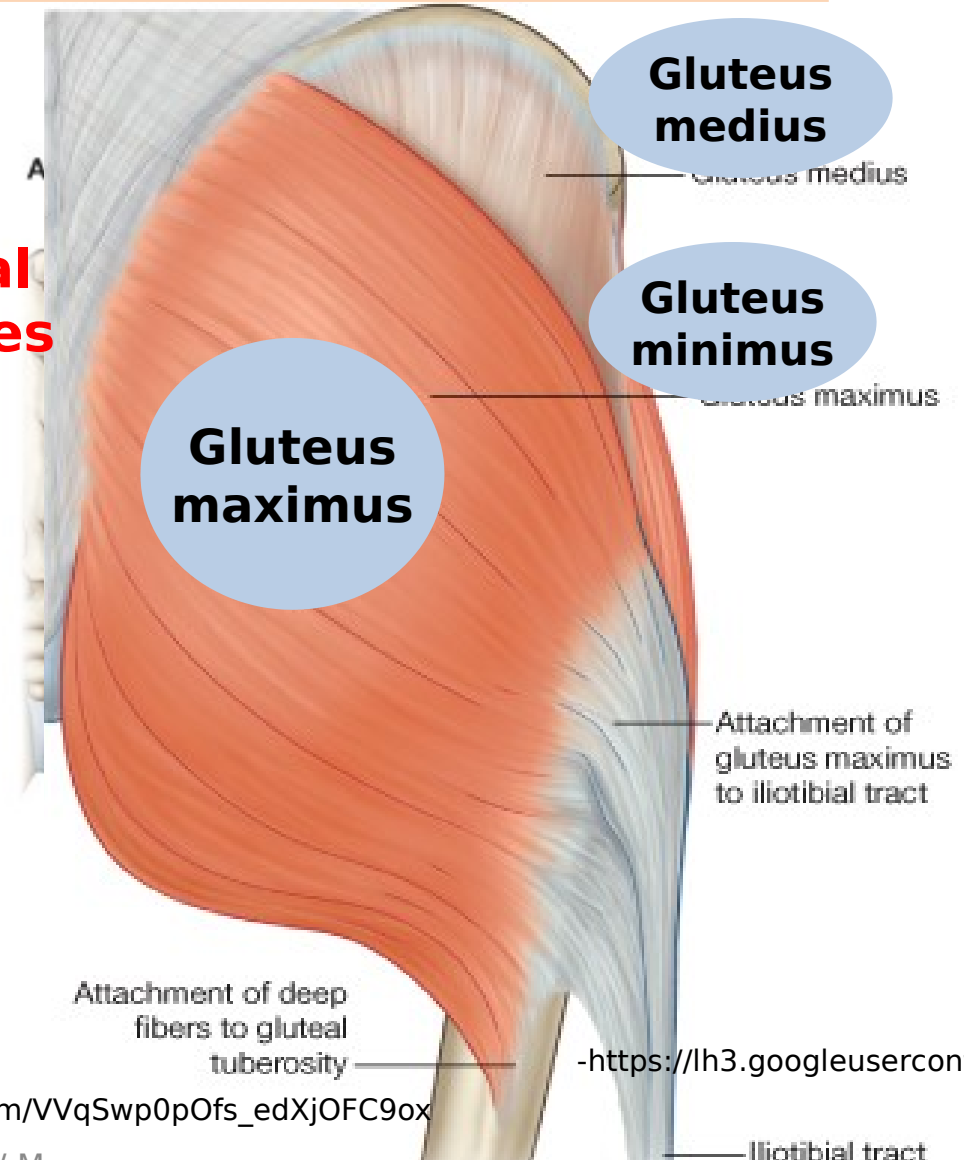
Large muscles of the gluteal region

1. **Gluteus maximus**
2. **Gluteus medius**
3. **Gluteus minimus**

3
Gluteal
muscles

4

ae



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Professor Azza Kamal/ Musculoskeletal & Integumentary System

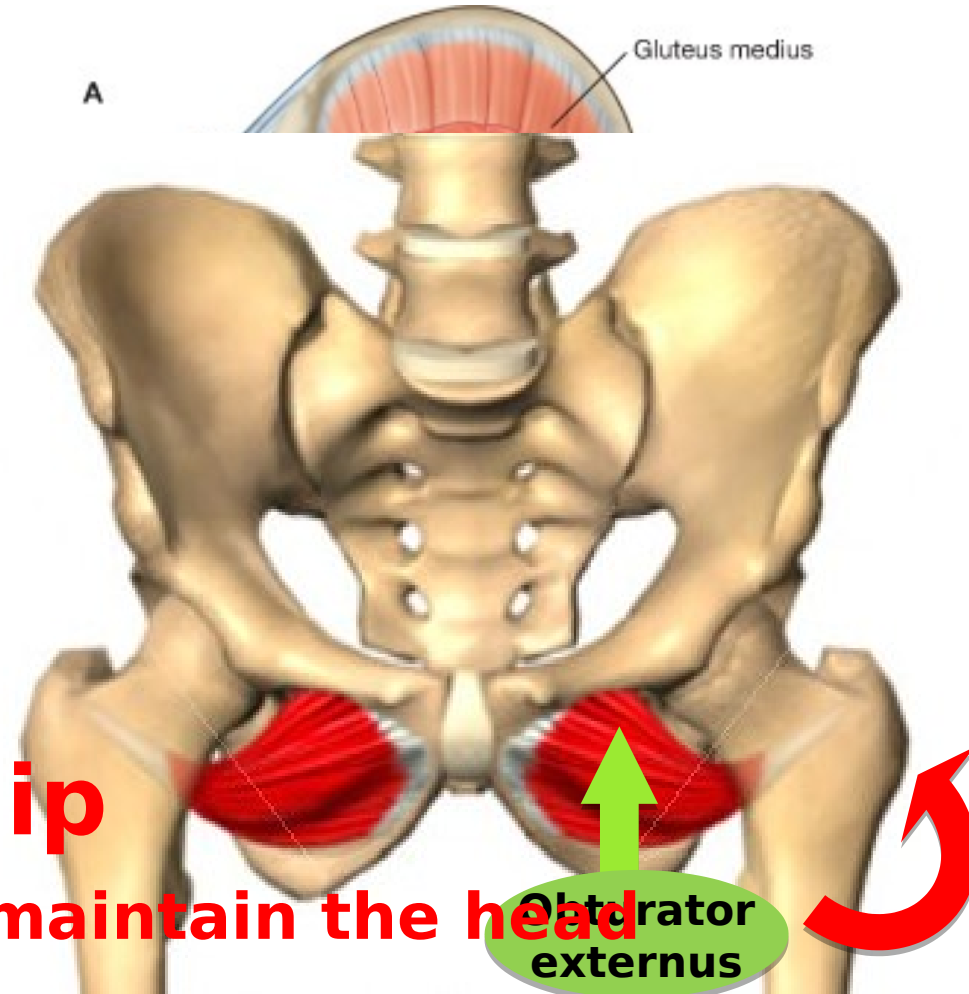
Small muscles of the gluteal region



1. Piriformis
2. Obturator internus
3. Superior Gemellus
4. Inferior Gemellus
5. Quadratus femoris
6. Obturator externus

6 lateral rotators of hip

they stabilize the hip joint (help to maintain the head of femur in the acetabulum)



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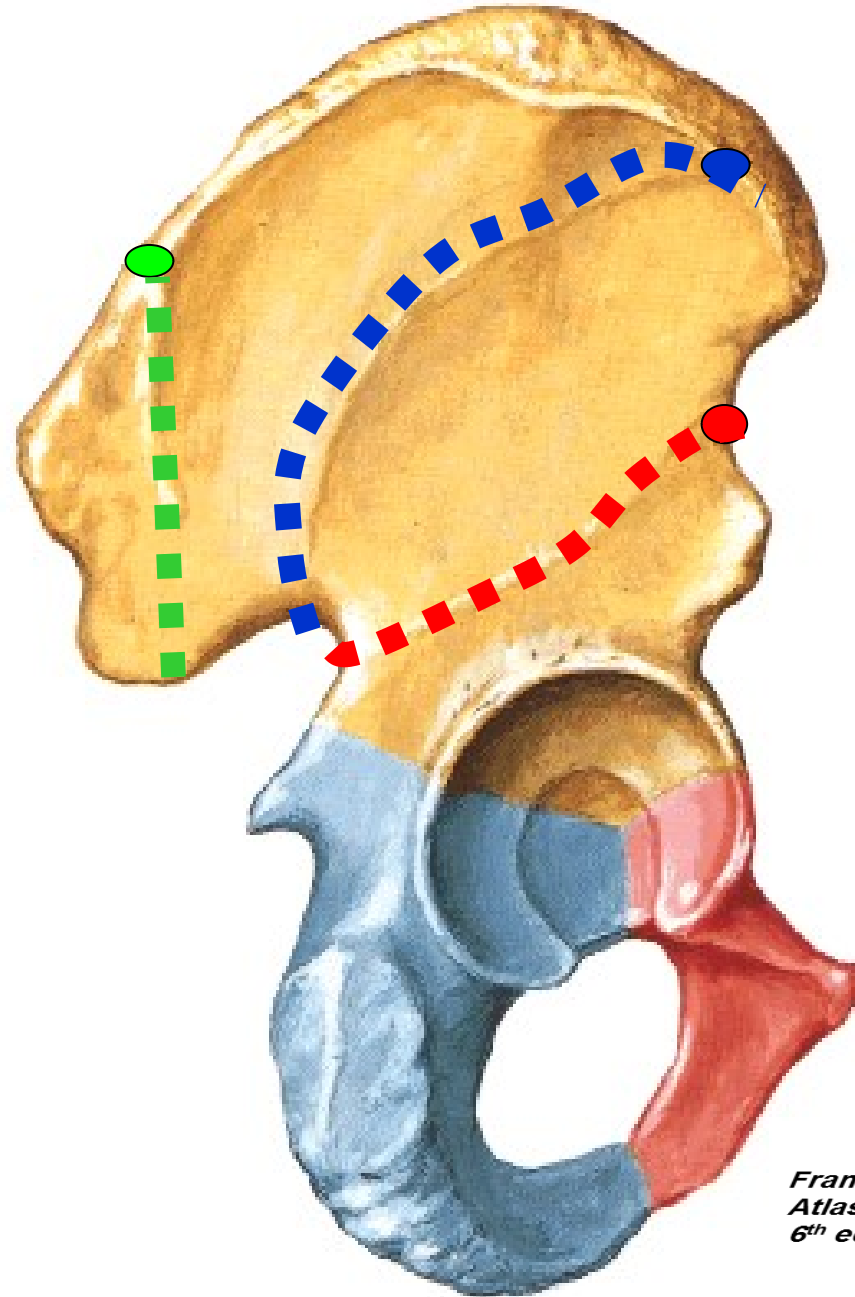


- **Gluteal surface of ilium:**
- **Divided into 4 areas by 3 gluteal lines**

1. Posterior gluteal line

2. Anterior gluteal line

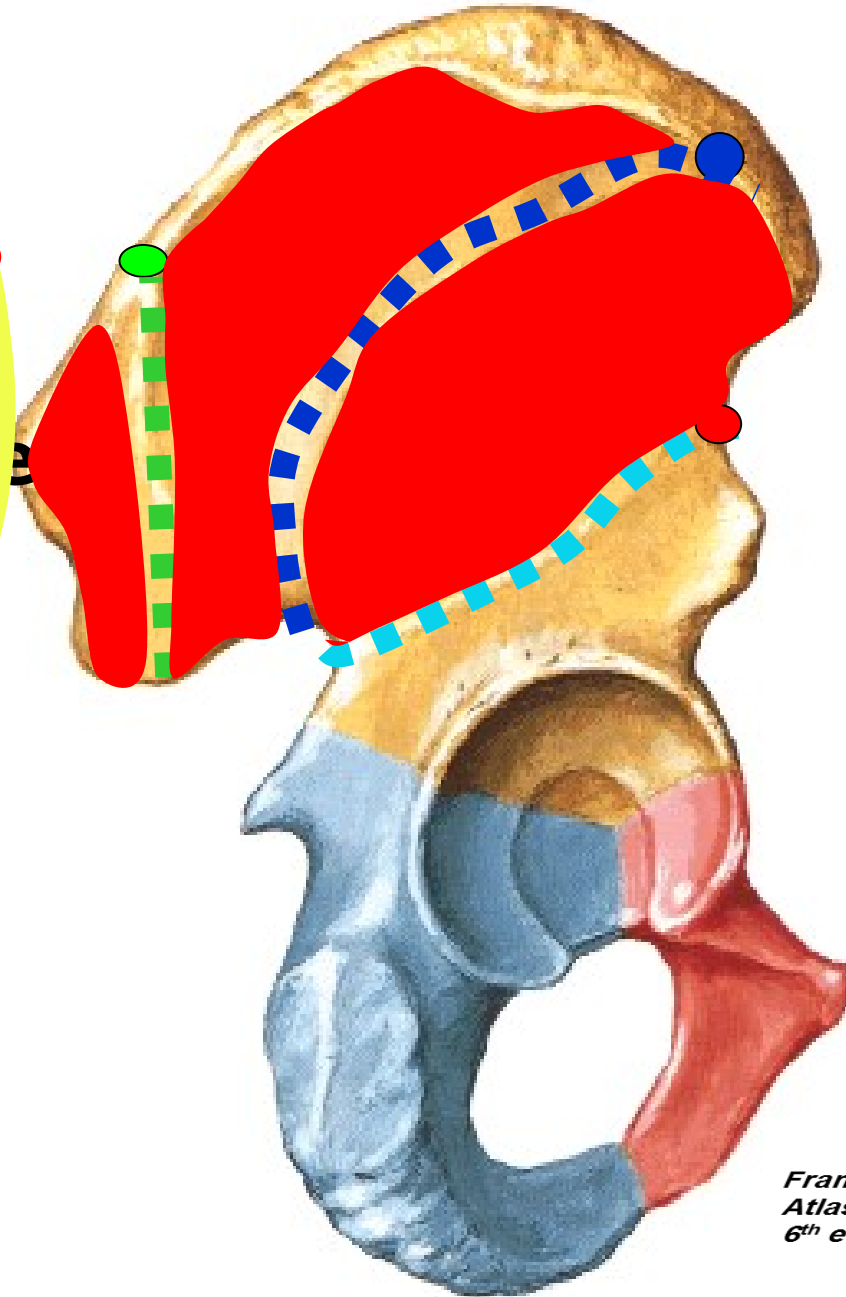
3. Inferior gluteal line



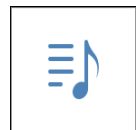
*Frank H. Netter
Atlas of Human Anatomy
6th edition*

Origin of gluteus minimus

□ between
anterior &
inferior gluteal
lines

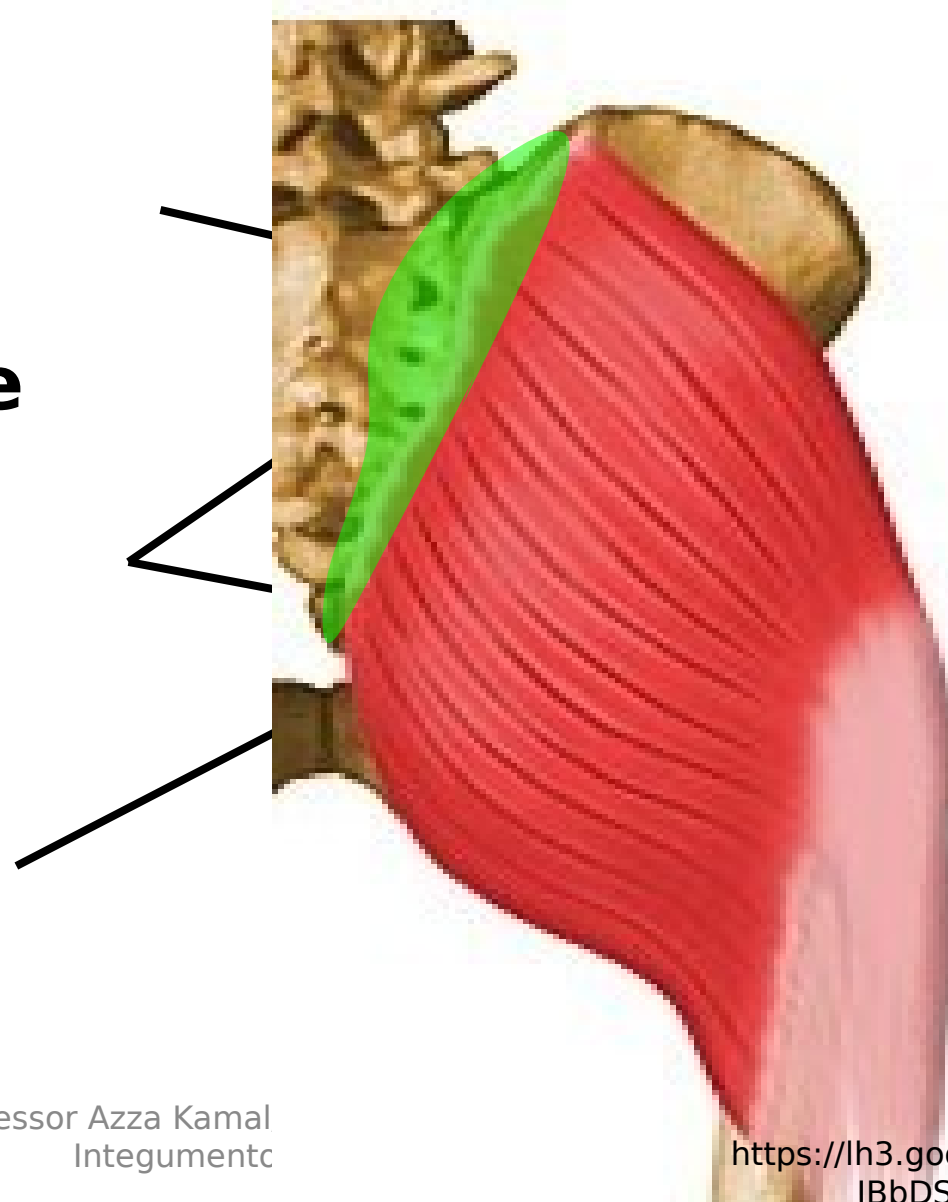
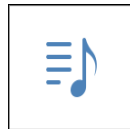


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6th edition*



Gluteus maximus

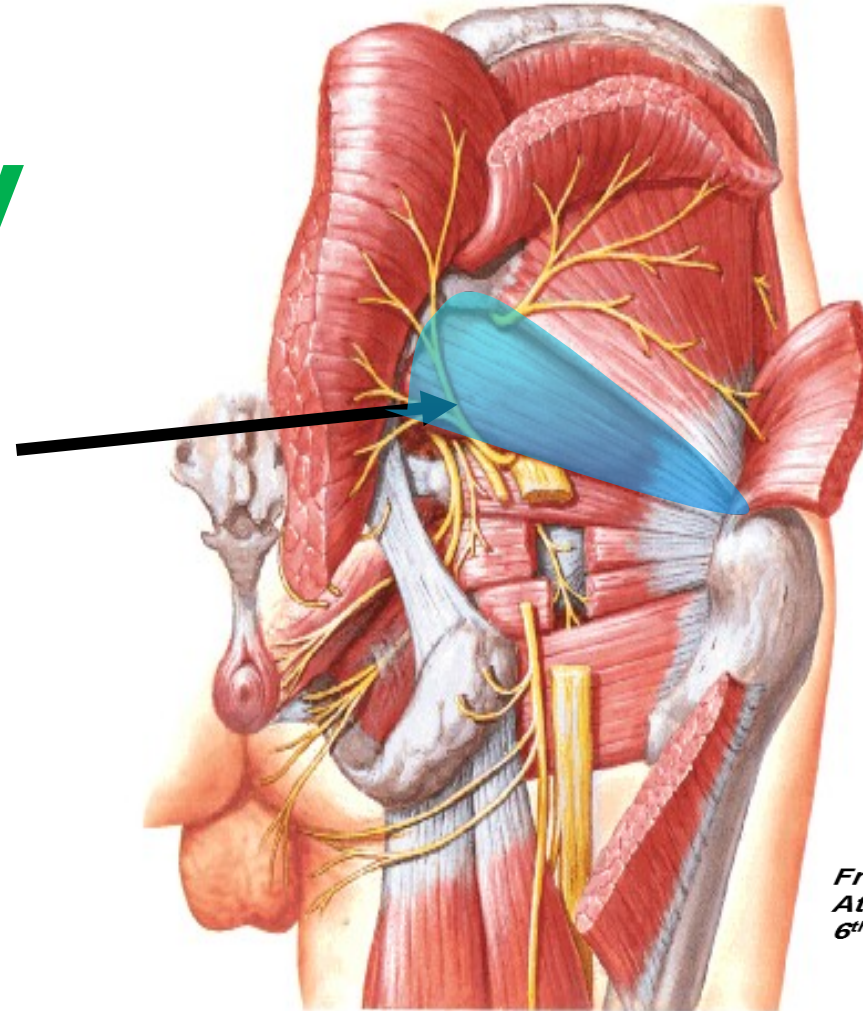
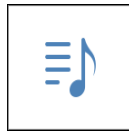
- **Origin** □
- **Gluteal surface of ilium behind posterior gluteal line**
- **Back of sacrum & coccyx**
- **Back of sacrotuberous ligament**



Gluteus maximus

Nerve supply

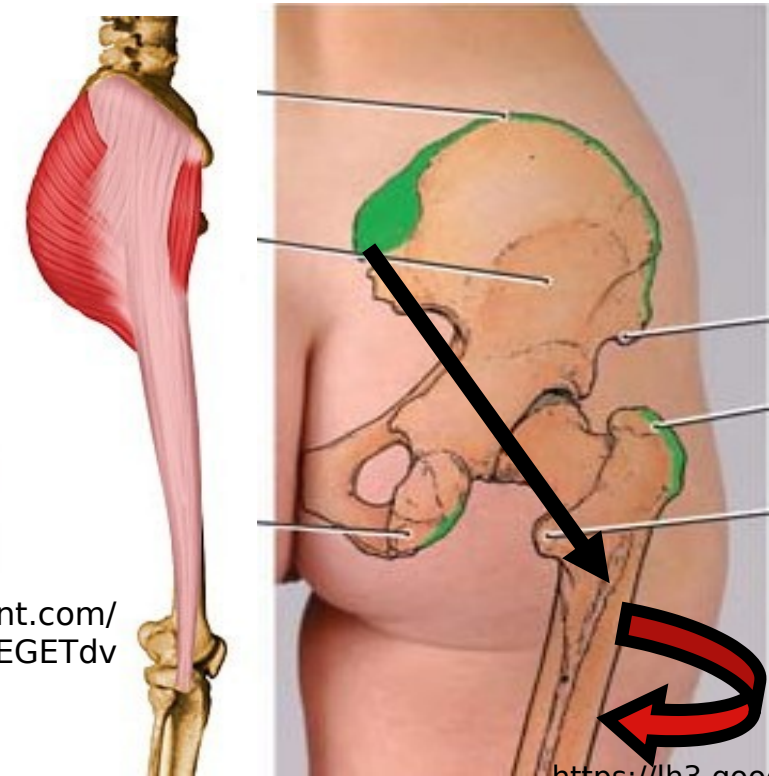
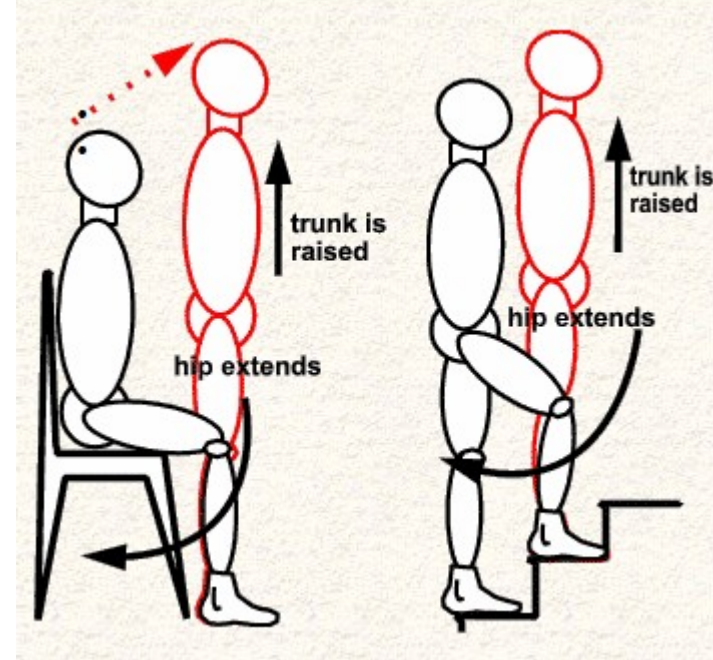
**Inferior
gluteal
nerve**



*Frank H. Netter
Atlas of Human Anatomy
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Action of gluteus maximus

- The main & strongest **extensor** of the hip joint (essential in standing up from the sitting position, climbing up stairs and running)
- Assists in **lateral rotation** of the thigh
- Through its attachment to iliotibial tract, it **stabilizes** hip bone on femur & femur on tibia during standing to maintain the erect posture



<https://lh3.googleusercontent.com/-gH1Sbi9EGETdv>

Professor Azza Kamal/ Musculoskeletal System



**Extension of the hip against resistance
(e.g. rising from sitting position)**



**Extension of the hip against resistance
(e.g. lifting heavy weights from ground)**



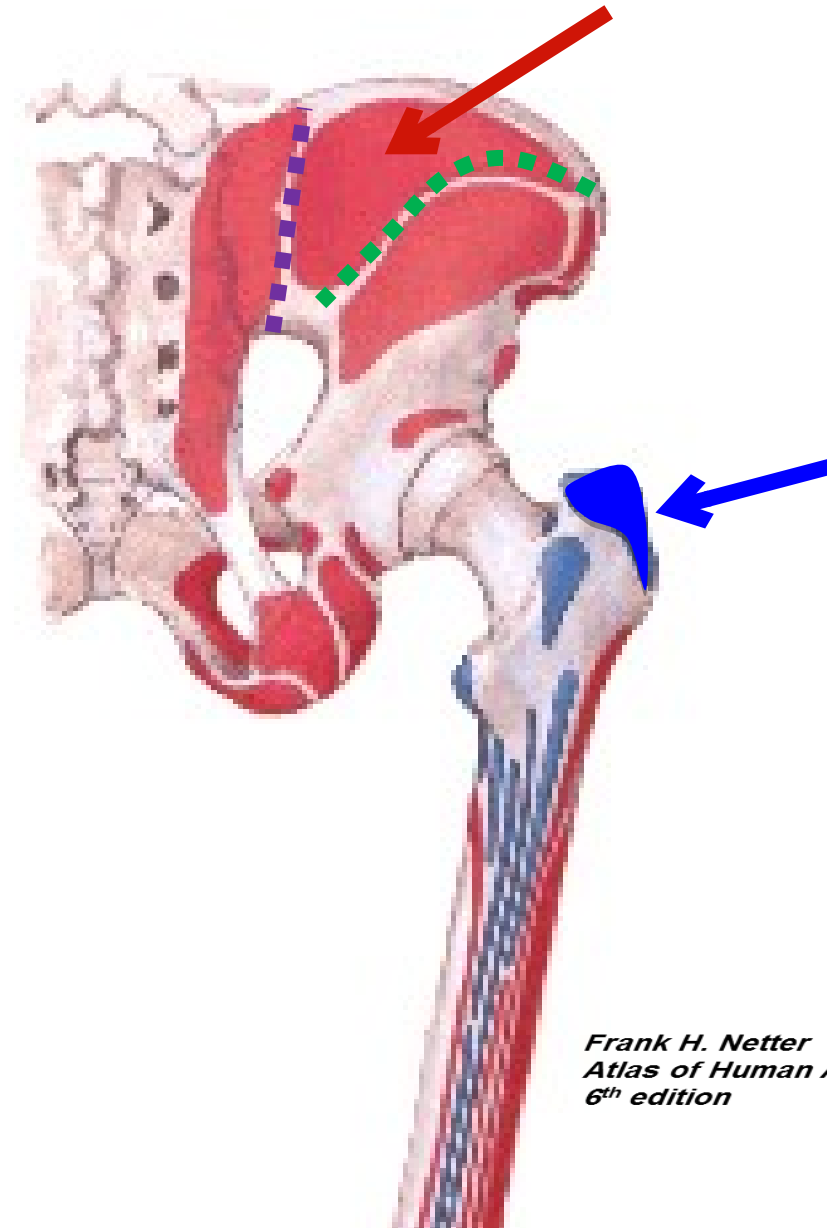
Extension of the hip against resistance



continuously active in strong lateral rotation of the thigh

Gluteus medius

- **Origin** □ gluteal surface of ilium, between **anterior** & **posterior** gluteal lines
- **Insertion** □ **lateral** surface of greater trochanter



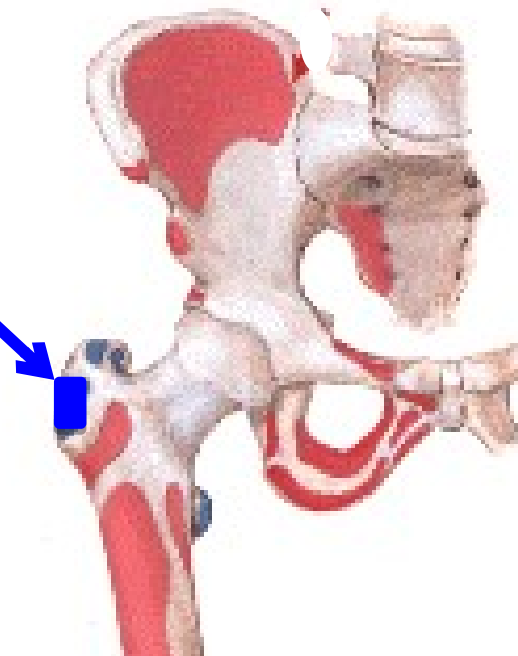
*Frank H. Netter
Atlas of Human Anatomy
6th edition*



Gluteus minimis

- **Origin** □
gluteal surface
of ilium,
between
anterior &
inferior gluteal
lines

- **Insertion** □
front of
greater

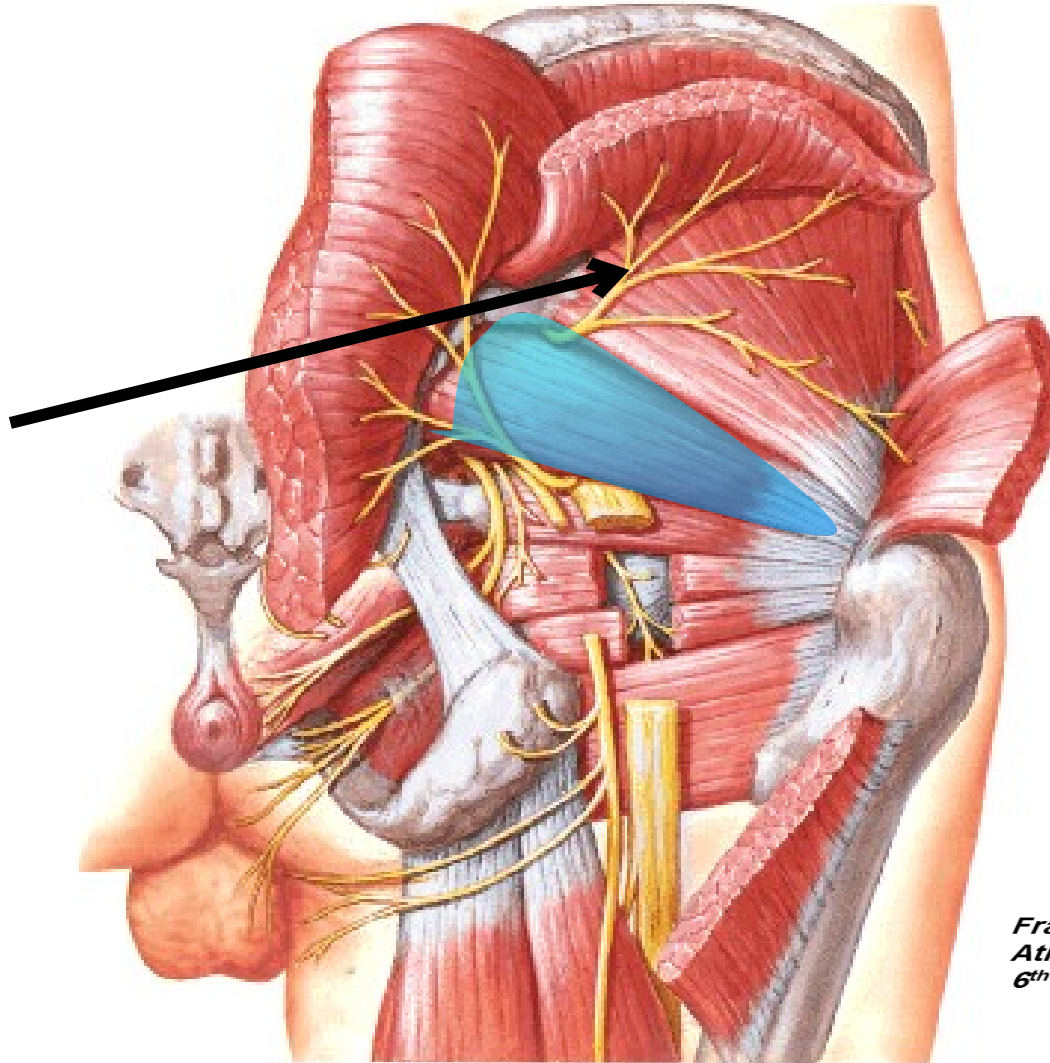
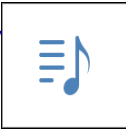


*Frank H. Netter
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Gluteus medius & minimus

- Nerve supply: superior gluteal nerve



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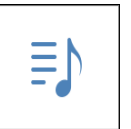
Minimus



Medius



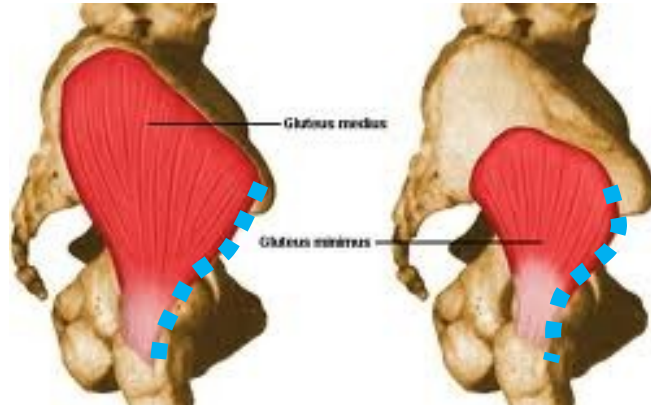
Maximus



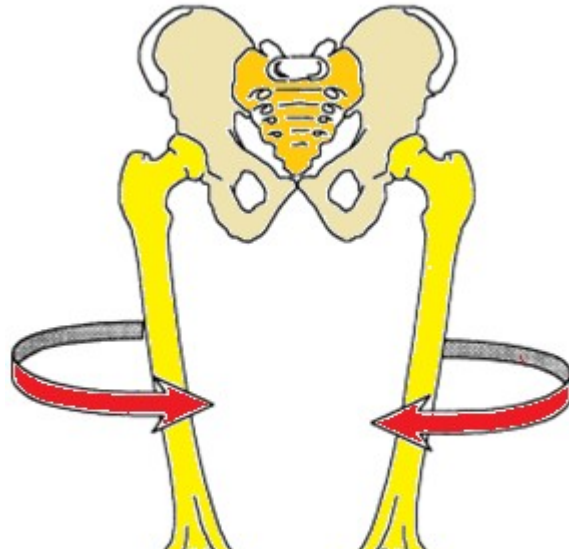
letal &

*Frank H. Netter
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Action of gluteus medius and minimus

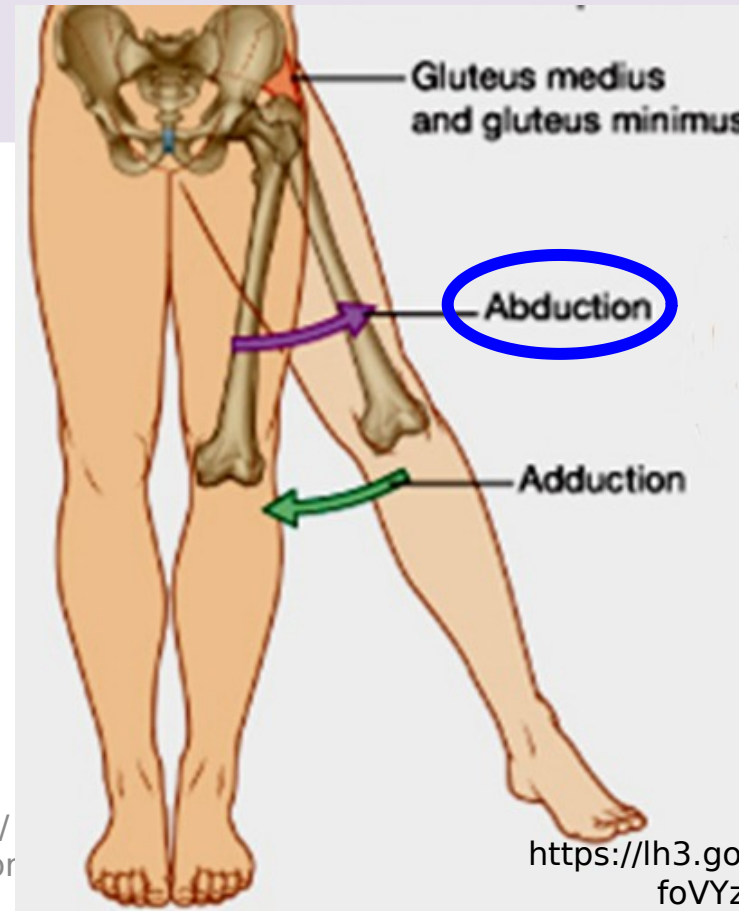


<https://lh3.googleusercontent.com/9WfD59VnpEoRnE4fuEBq>



**Their anterior
fibers
are medial
rotators**

Main abductors of



6/11/24

<https://lh3.googleusercontent.com/97cE2rutIMve6ZNdKfhEFU>

Azza Kamal/
tegumentor

<https://lh3.googleusercontent.com/foVYzFe9Be88tZW7keWEA>

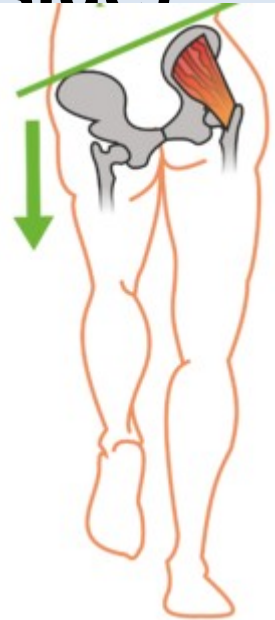
🌻 Action of glutei medius & minimus

🌻 Powerful abductors of thigh



Action of glutei medius & minimus

In walking, gravity tends to tilt the pelvis and trunk to the unsupported side (raised limb side)



Glutei medius & minimus of the supporting side (right side) contract to prevent tilting of the pelvis to the unsupported limb



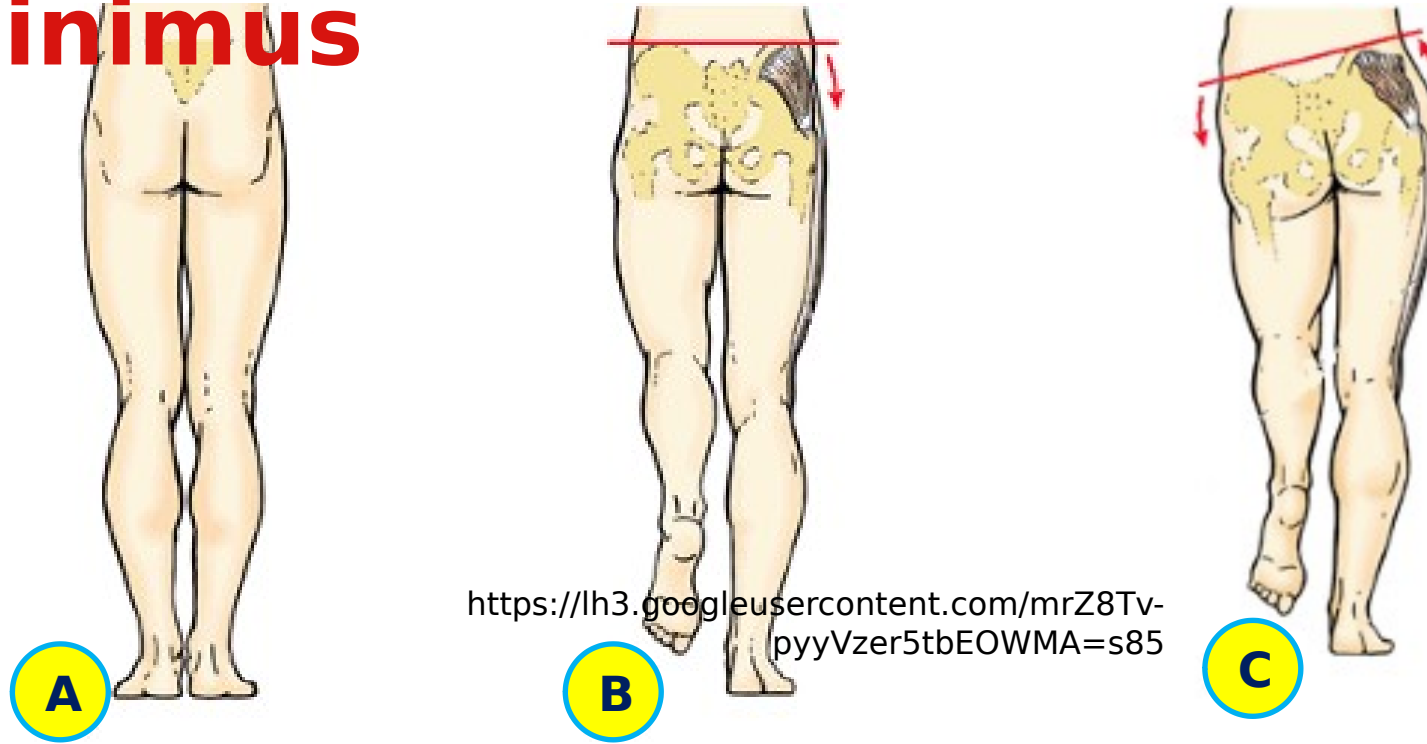
Glutei medius & minimus are important in each step during walking to maintain the balance of the pelvis

<https://lh3.googleusercontent.com/cqE37EvgFvIc0dULZcNjS4i>

Professor Azza Khalil, MSc in Skeletal & Integumentary System



Action of gluteus medius and minimus



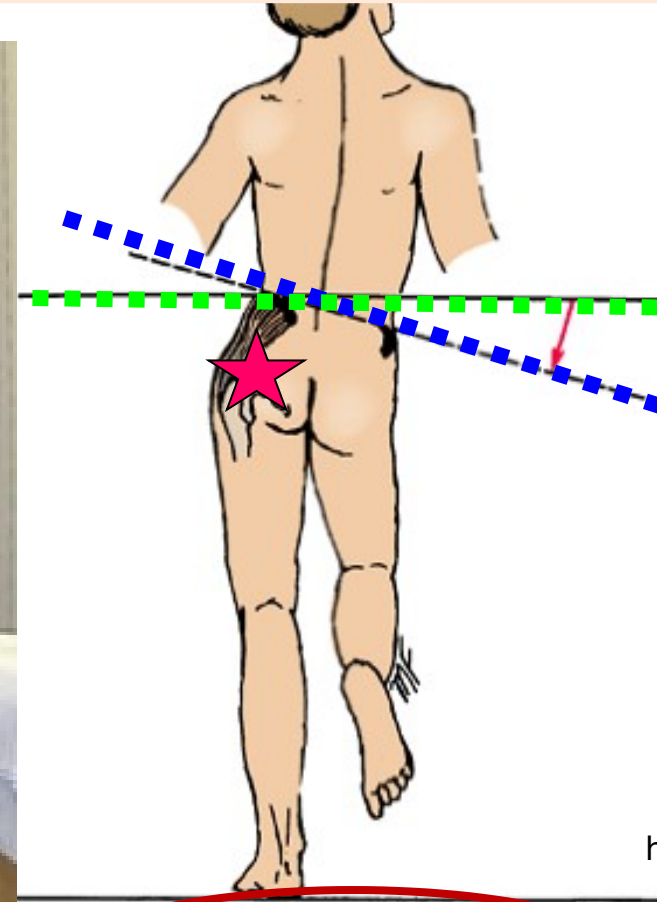
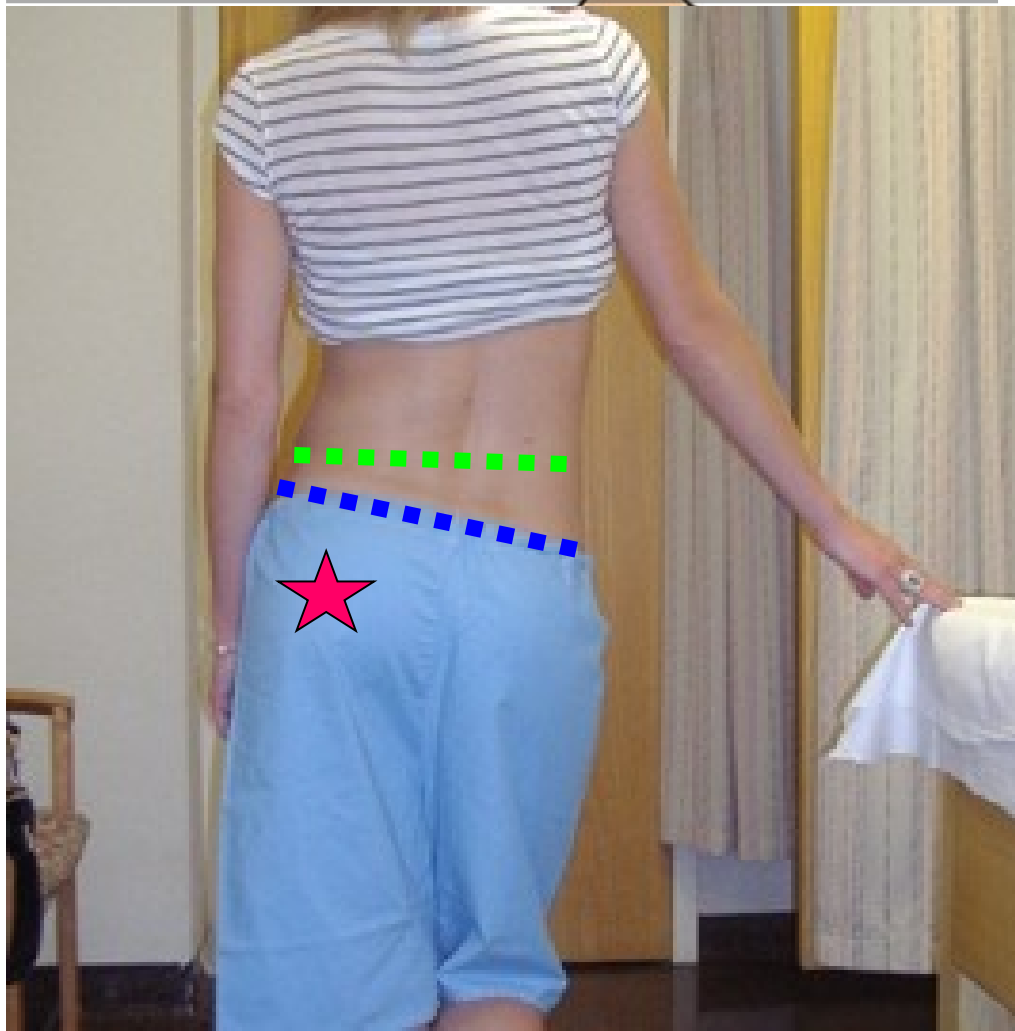
(A) When the weight is carried by both feet, the pelvis is evenly supported and does not tilt

(B) When the weight is carried by the right lower limb, the muscles on the right side fix the pelvis so that it does not tilt to the unsupported left side.

(C) When the abductors on the right side are paralyzed (due to a lesion of the right superior gluteal nerve) fixation by these muscles is lost and the pelvis tilts to the unsupported left side
(positive Trendelenburg)

Positive Trendelenburg's sign

Ask the patient to stand on the affected side (Lt side) the pelvis tilts to the normal unsupported side (Rt side) indicating a positive **TRENDELENBURG SIGN**



positive Trendelenburg's sign

<https://lh3.googleusercontent.com/hPKIDGUzes3mODKfI5hGct>

Paralysis of the glutei medius & minimus due to injury of superior gluteal nerve leads to:



In case of
unilateral
paralysis

**Lurching
gait**

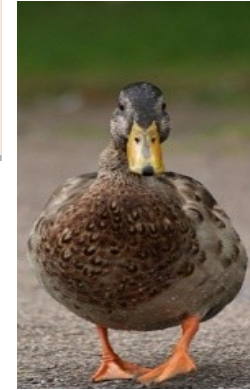


The patient
complains that
when he
stands on the
injured side,
the pelvis will
tilt towards
the normal
side

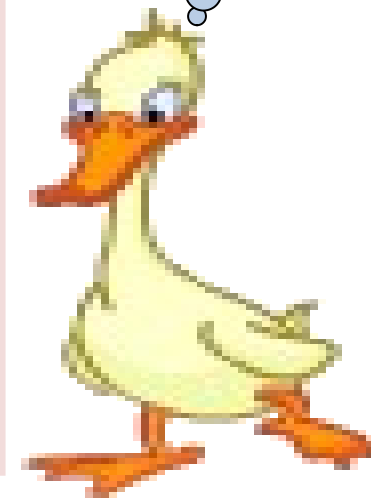
In case of
bilateral
paralysis

**Waddling
gait**

The patient
complains
that during
walking the
trunk is
flexed from
side
to side with
each step



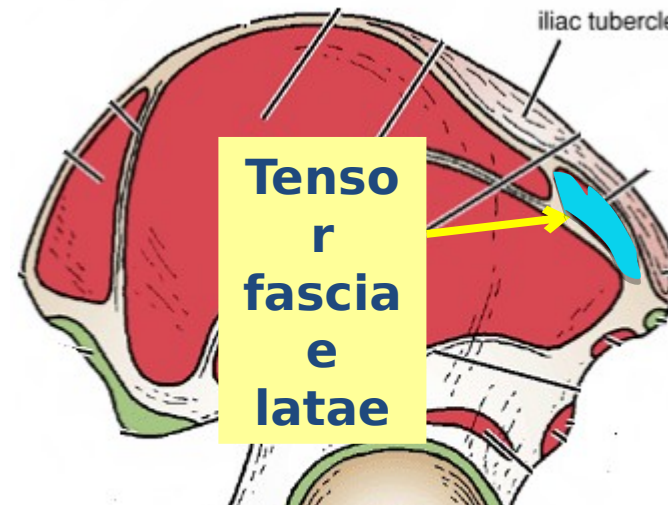
Waddling
like a
duck



Tensor fasciae latae



- **Origin** □ from anterior part of outer lip of iliac crest



<https://lh3.googleusercontent.com/-Ws0573amuyVGDR8>

- **Insertion** □ into iliotibial tract, which attaches to lateral condyle of tibia

Nerve supply □ superior gluteal

nerve

1) Tightens the iliotibial tract to stabilize the hip bone on femur & the femur on tibia to maintain the erect posture.

2) Helps extending



<https://lh3.googleusercontent.com/>

**A 54 -year- old male presents with difficulty in walking.
When asked to stand on his left foot , his right hip tilts
significantly downward .**

Which of the following nerves is the most likely injured?

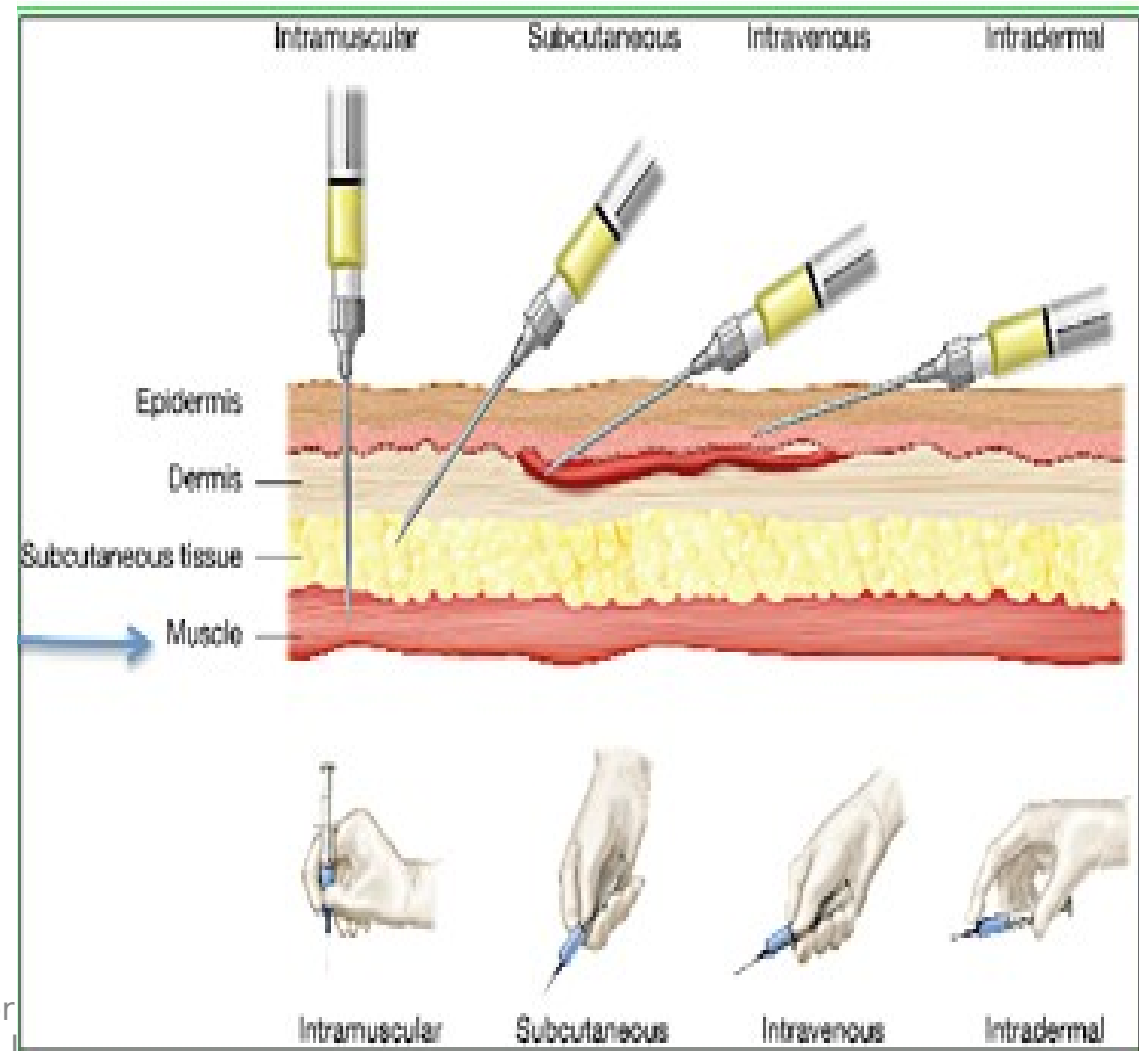
- A. Left superior gluteal**
- B. Left inferior gluteal**
- C. Right superior gluteal**
- D. Right inferior gluteal**
- E. Sciatic**



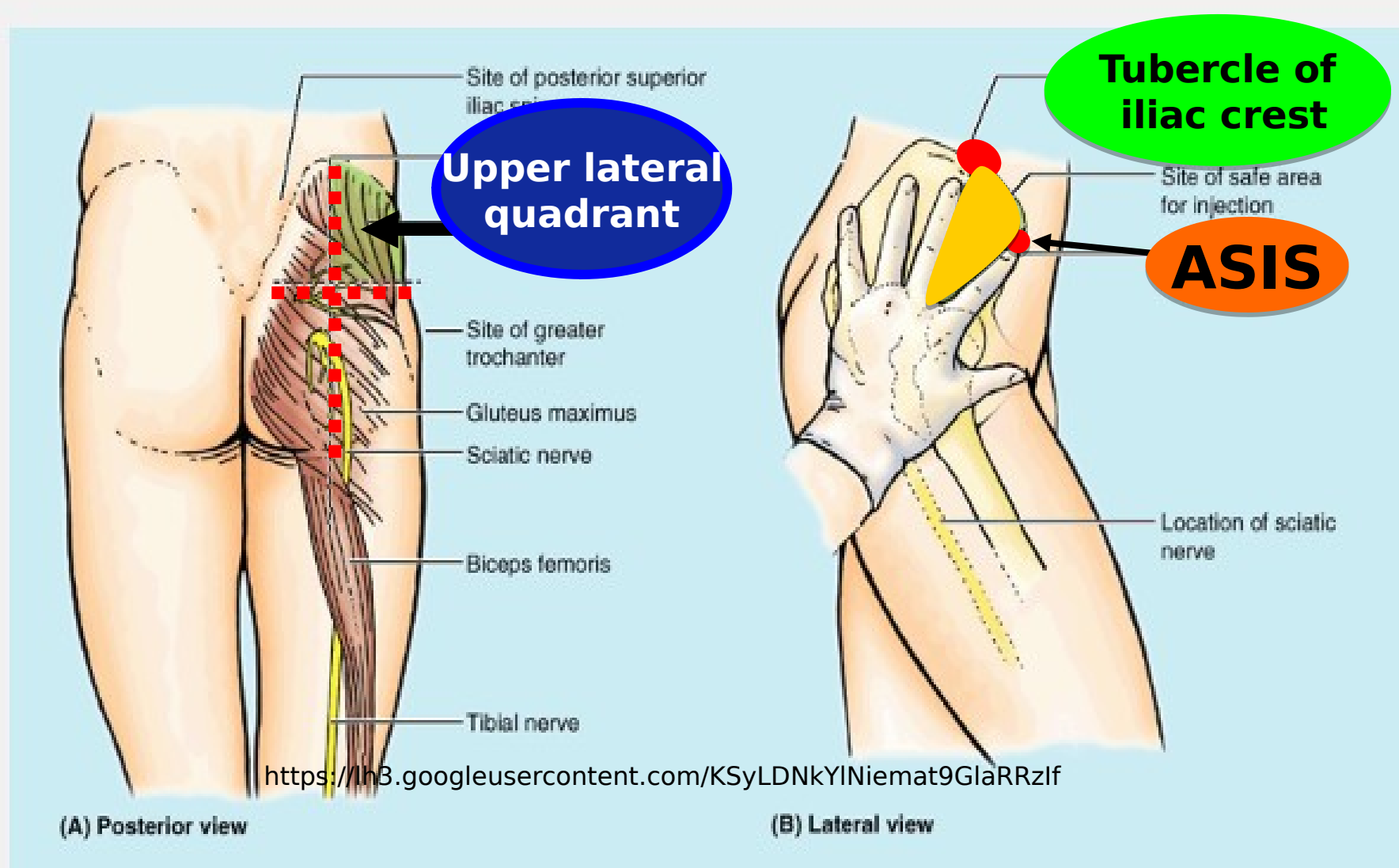
Applied anatomy

- Because of the rich vascularity of the glutei muscles, it is advisable to do a short aspiration before an intramuscular injection as the tip of the needle may unfortunately lie inside the lumen of a blood vessel.

6/11/24



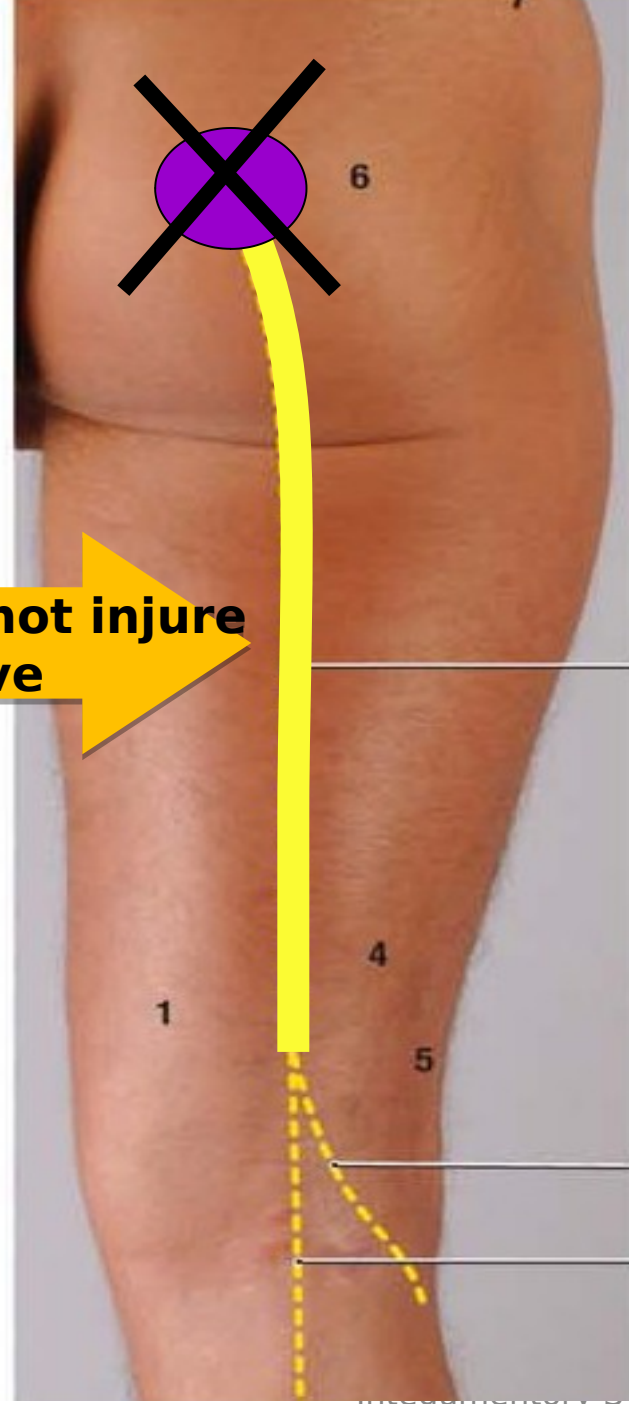
Safe site for intramuscular injection in gluteal region □ upper lateral quadrant



DANGER!

So you do not injure sciatic nerve

DANGER!



Sciatic nerve

image

Common fibular nerve

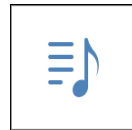
Tibial nerve

NEVER GIVE INTRAMUSCULAR INJECTION IN CENTER OF BUTTOCK



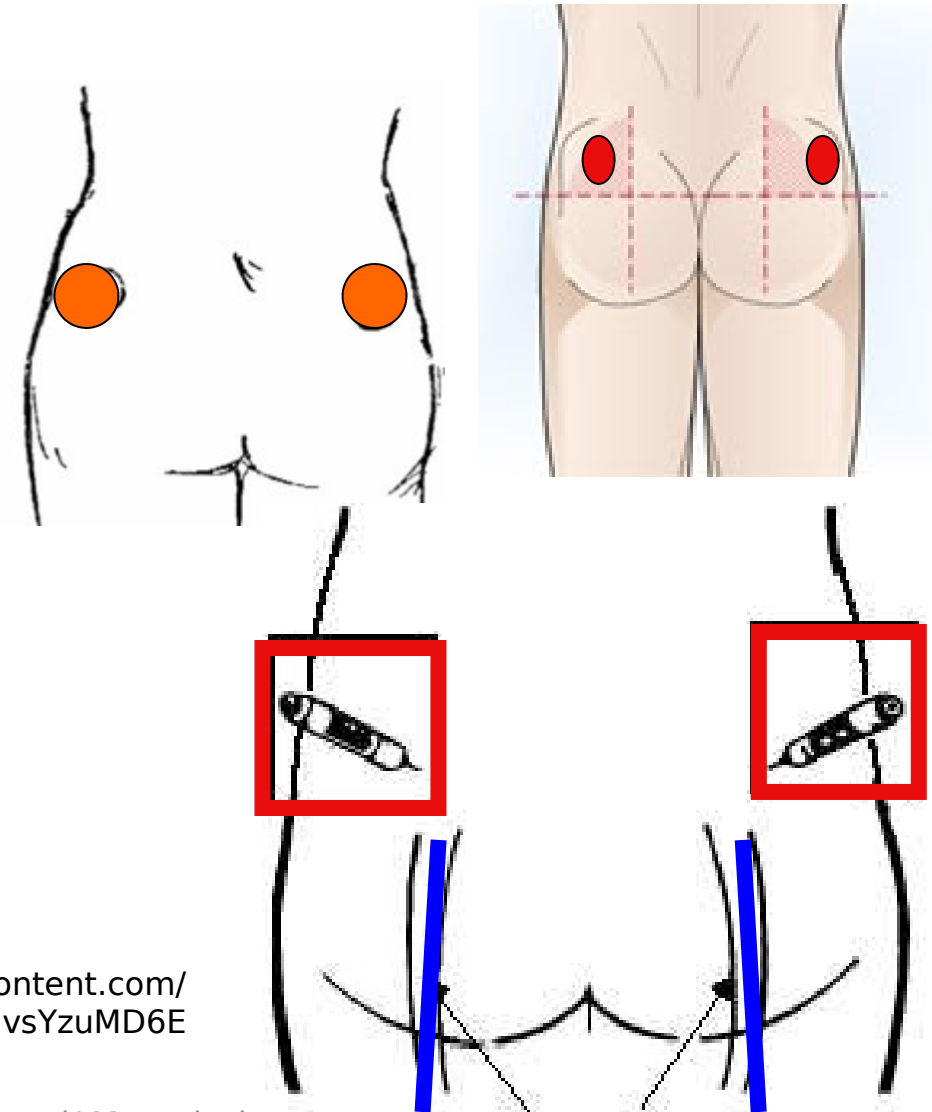
Safest site for intramuscular injection

- **Superolateral part of buttock**
- **Avoid medial side of buttock so as not to injure the sciatic nerve**



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Which of the following quadrants is considered as a safe site for giving an IM injection in the gluteal region

- A. Upper medial
- B. Upper lateral
- C. Lower medial
- D. Lower lateral
- E. Center of buttock



:Suggested Textbook

Clinical Anatomy for Medical Students

Richard S. Snell/ Third Edition

Pages: 569-572, 678, 688